

AMENDMENTS TO THE CLAIMS

1: (Currently Amended) A demodulation method for establishing synchronization from a received signal that contains a synchronization establishment signal wherein the whose change in amplitude periodically alternates between positive and negative, and for demodulating said the received signal, said demodulation method comprising:

the demodulation method comprising a step of establishing synchronization from said received signal based on a plurality of timings the timing of changes in the positive/negative polarity of the change in amplitude of the synchronization establishment signal contained in the received signal; and
demodulating said the received signal.

2. (Currently Amended) A demodulation method according to claim 1, wherein synchronization is established from a plurality of received signals for each received signal from a plurality of received signals, and each of said the received signals is demodulated.

3. (Currently Amended) A synchronization establishment apparatus that establishesoperable to establish synchronization from a received signal that contains a preamble pattern synchronization establishment signal wherein thewhose change in amplitude periodically alternates between positive and negative, thesaid synchronization establishment apparatus comprising:

positive/negative change timing detection means that detects for detecting a plurality of timings the timing of changes in the positive/negative polarity of the change in amplitude of the preamble pattern; synchronization establishment signal contained in the received signal; and

synchronization establishment means that establishes for establishing synchronization from said the received signal based on the detected timings detected by said positive/negative change timing detection means.

4. (Currently Amended) A modem that modulatesoperable to modulate transmitted signals, and also establishesto establish synchronization from a received signal that

contains a synchronization establishment signal wherein the whose change in amplitude periodically alternates between positive and negative, demodulates said and to demodulate the received signal, the said modem comprising:

modulating means that modulates for modulating transmitting transmitted signals; positive/negative change timing detection means that detects for detecting a plurality of timings the timing of changes in the positive/negative polarity of the change in amplitude of the synchronization establishment signal contained in the received signal; synchronization establishment means that establishes for establishing synchronization from said the received signal based on the detected timings detected by said positive/negative change timing detection means; and

demodulation means that demodulates said for demodulating the received signal according to the established synchronization timing established by said synchronization establishment means.

5. (Currently Amended) In a A traffic information system wherein comprising at least one base stations station operable to and mobile stations communicate wirelessly with mobile stations, a base station that modulates to modulate signals, and to wirelessly transmits transmit the modulated signals same to the mobile stations, and also to wirelessly receives receive from the mobile stations a signal from the mobile stations that contains a synchronization establishment signal wherein the whose change in amplitude periodically alternates between positive and negative, to establish establishes synchronization from said the received signal, and demodulates said to demodulate the received signal, the said at least one base station comprising:

an antenna that transmits operable to transmit and receives receive wireless signals; modulating means that modulates for modulating signals; transmission means that wirelessly for wirelessly transmitting transmits the modulated signals to the mobile stations via the said antenna;

receiving means that receives for receiving, via the said antenna, signals transmitted wirelessly from the mobile stations;

positive/negative change timing detection means that detects for detecting a plurality of timings the timing of changes in the positive/negative polarity of the change in amplitude of the synchronization establishment signal contained in the received signal;;

synchronization establishment means that establishes for establishing synchronization from said the received signal based on the detected timing timings detected by said positive/negative change timing detection means;;

demodulation means that demodulates said for demodulating the received signal according to the established synchronization timings established by said synchronization establishment means; and

control means that communicates for communicating the signals exchanged with the mobile stations to an external apparatus.

6. (Currently Amended) A synchronization establishment apparatus according to claim 3, wherein further comprising amplitude difference detection means for detecting a difference between two squared values of the received signal that have different timings of one symbol and the detected difference as the change in amplitude.

synchronization is established from a plurality of received signals for each received signal.

7. (Currently Amended) A synchronization establishment apparatus according to claim 3, further comprising change point measurement means for averaging the plurality of timings detected by said positive/negative change timing detection means.

A modem according to claim 4, wherein synchronization is established from a plurality of received signals for each received signal and each of said received signals is demodulated.

8. (Currently Amended) A synchronization establishment apparatus according to claim 3, wherein said positive/negative change timing detection means extracts a plurality of timings at which the value of the waveform of the change in amplitude crosses the zero point.

A base station according to claim 5, wherein
synchronization is established from a plurality of received signals for each
received signal and each of said received signals is demodulated.

9. (Currently Amended) A demodulation method according to claim 1, wherein
a preamble pattern wherein in which 1001 is repeated in $\pi/4$ -shift QPSK is used as
the synchronization establishment signal, and
a burst signal containing said the preamble pattern is used as the received signal.

10. (Currently Amended) A synchronization establishment apparatus according to
claim 3, wherein

the a-preamble pattern contains a repeating pattern of wherein 1001 is repeated in
 $\pi/4$ -shift QPSK, is used as the synchronization establishment signal, and
a burst signal containing said the preamble pattern is used as the received signal,
and
synchronization is established from a plurality of preamble patterns for each burst
signal.

11. (Currently Amended) A modem according to claim 4, wherein
a preamble pattern wherein in which 1001 is repeated in $\pi/4$ -shift QPSK is used as
the synchronization establishment signal, and
a burst signal containing said the preamble pattern is used as the received signal,
synchronization is established from a plurality of preamble patterns for each burst
signal, and
each of the received signals is demodulated.

12. (Currently Amended) A base station according to claim 5, wherein
a preamble pattern wherein in which 1001 is repeated in $\pi/4$ -shift QPSK is used as
the synchronization establishment signal, and
a burst signal containing said the preamble pattern is used as the received signal,

synchronization is established from a plurality of preamble patterns for each burst signal, and

each of the received signals is demodulated.

13. (Currently Amended) ~~A synchronization establishment apparatus according to claim 10, wherein~~ A synchronization establishment apparatus operable to establish synchronization from a received signal that contains a synchronization establishment signal whose change in amplitude periodically alternates between positive and negative, said synchronization establishment apparatus comprising:

positive/negative change timing detection means for detecting a timing of changes in the positive/negative polarity of the change in amplitude of the synchronization establishment signal contained in the received signal; and

synchronization establishment means for establishing synchronization from the received signal based on the timing detected by said positive/negative change timing detection means;

wherein a preamble pattern in which 1001 is repeated in $\pi/4$ -shift QPSK is used as the synchronization establishment signal, and a burst signal containing the preamble pattern is used as the received signal; and

the wherein said synchronization establishment apparatus further comprises:

an amplitude difference detection circuit that uses ~~operable to use~~ an A/D converter to convert the received burst signal from an analog signal to a digital signal, squares ~~to square~~ the value of the converted digital signal, and outputs ~~to~~ output the temporal change of ~~the~~ squared value as a difference signal;

a low pass filter that takes ~~operable to filter~~ the difference signal outputted from ~~the~~ said amplitude difference detection circuit, and filters and outputs ~~to~~ output the filtered signal,

a polarity bit converter that outputs ~~operable to output~~ data of different values when the polarity value of the filtered signal outputted output value from the said low pass filter is positive than when the polarity value of the filtered signal outputted from said low pass filter is negative;

a change point extraction circuit thatoperable to, based on the output value outputted from the said polarity bit converter, extracts extract the timing at which the value of the waveform of the amplitude difference based on the squared value crosses the zero point;;

a change point measurement circuit that averagesoperable to average the positive/negative change point timing of said the extracted amplitude difference based on the squared value;;

a clock synchronization establishment circuit thatoperable to, based on the average value from the of the positive/negative change point timing averaged by said change point measurement circuit, establishes establish clock synchronization; and

a timing generation circuit thatoperable to, based on the timing at which the received burst signal starts, determines determine a the position to reset the a clock.